

Dealing with the Tsunami dead: unprecedented international co-operation

Joseph Scanlon reports on the first major research into cross-cultural handling of the deceased after mass death incidents

Introduction

After a mass death incident, recovery and identification of the dead is normally done by the country where the incident occurs. It may ask assistance in gathering information to help identify the dead and with next of kin but it will handle everything else itself.

However, after the first Bali bombings, Australia negotiated a two country co-operative agreement that set the stage for an unprecedented multi-national response to the December 2004 Indian Ocean tsunami. That response solidified the world mass death network and may lead to more detailed protocols for future similar situations. Nevertheless, in the early stages the response to the tsunami matched what has happened in other widespread destructive incidents.

In the past, there have been two distinct patterns of initial response to mass death situations.

If the event occurs at a specific controllable location the bodies are marked and photographed in place before being carefully removed by emergency personnel in line with guidelines of the International Criminal Police Organization (Interpol). Those guidelines state:

Total site security is essential... It may be necessary to fence the site or otherwise clearly demarcate it, and there will be a need for round the clock uniformed guards... All property, wreckage, bodies, etc. must remain in situ if at all possible (Interpol, 1997).

This happened after terrorist attacks on London transport, after the attack on the Murrah building in Oklahoma City, and in Gander, Newfoundland after soldiers from the 101st Airborne were killed in an air crash (Emergency Communications Research Unit, 1985).

In contrast, if the deceased are spread over a wide area these guidelines will not be followed. Instead, the bodies will be picked up by survivors and others and taken to public buildings and places of worship. This happened in Halifax, Nova Scotia after the 1917 munitions ship explosion, in Rapid City, South Dakota after the 1972 flood, in Darwin in 1974 after *Cyclone Tracy*, and in Kobe after the 1995 earthquake (Scanlon, 1998; Hershiser, 1974, Scanlon, 1979; Nishimura, 1997).

There have been two exceptions to these patterns.

Occasionally, because most or all the deceased were foreign nationals, their country was allowed to remove the bodies. After a collision between a Pan American and a KLM aircraft at Tenerife, Spanish authorities allowed the Americans and Dutch to take the bodies to the USA and the Netherlands (Brannon

and Morlang, 2001). After the ferry *Scandinavian Star* was towed into the Swedish port, Lysekil, the burned bodies were taken to Oslo.

The other exception involves Israel. Under Hebraic law, a woman is not a widow unless a rabbinic court rules her husband has died. Thus Israelis will go to extraordinary lengths to identify a body. After an air crash in Sudan, an Israeli police forensic pathologist hired trackers and found and identified the bones of the Israeli pilot.

Bali difference

Bali was different because the response was not solely from the country where the incident occurred. Because so many Australians were involved, the Australian Federal Police (AFP) responded immediately and, after lengthy discussion, it was agreed they would be the lead agency in support of Indonesian police in identifying the dead and investigating the bombings. Korea, Japan, the Netherlands, Sweden, and New Zealand assisted with the dead. Britain and the United States assisted with the investigation. But everything was done under a two-country agreement between Indonesia and Australia.

The two-country agreement specified that Disaster Victim Identification (DVI) work would be done on all the deceased. While the 'D' stands for 'Disaster' DVI specialists deal with all types of death. It also specified that bodies would not be released until

Indonesian authorities approved. These two points set the stage for the tsunami.

When the tsunami struck Thailand, there was a response from every continent but Antarctica. There were diplomats from embassies in Thailand and foreign ministries around the world as well as police scene crime officers, investigators, fingerprint specialists, DVI officers, pathologists, odontologists (forensic dentists), forensic anthropologists, civilians from ZAKA (which looks after Israeli suicide bombings), and IT specialists including military personnel.

Before most foreigners arrived, as had happened after other widespread destructive incidents, survivors were collecting bodies and taking them to Buddhist temples laying them on the ground in temple courtyards. A few went to a hospital morgue. There were no records of who they were or where they came from.

Thai personnel attached a tag to each body, photographed it showing the number and posted those photos on bulletin boards and web sites. If the body was 'recognised' by someone, they could take that body. Since visual identification is unreliable and since some of those bodies were cremated it will never be known if those identifications were accurate. Other bodies were repatriated overseas with several countries – including Australia – checking them on arrival to ensure correct identification.

After discussions between Thai authorities and the foreigners assisting, it was agreed bodies would be processed at four sites known as 1A and B, 2 and 3, each managed by a different foreign country. Site 1A was the responsibility of Australia (assisted by New Zealand); Site 1B was the Nordic countries (Norway, Sweden, Denmark and Finland); Site 2 was Germany and Austria; and Site 3 was Israel. International personal

worked with Thais to identify bodies using three criteria as the basis for identification. These were fingerprints, dental records and DNA. Anything else would be corroborating evidence and the working language would be English.

Information Management Centre

The identification process, while varied in order, included some basic steps. The process became that a body would be brought from refrigerated containers by Thai soldiers and x-rayed. Police officers would examine clothing and jewellery. Clothing would be removed and anything visible noted like tattoos and birth marks. Next the body went to pathologists and an odontologist where teeth were extracted for DNA. The body would be cleaned and returned to the body bag. A scribe recorded the data and took it to the Thai Tsunami Victim Identification – Information Management Centre (TTVI-IMC).

In order to identify a body two things must be done. Information acquired from the body after death – known as Post Mortem (PM) data – must be matched with information acquired while the person was alive – known as Ante Mortem (AM) data. PM data consists of fingerprints and dental records and other information taken from the body. AM data consists of things like fingerprints obtained from something the person has handled while still alive, dental records acquired from the person's dentist and/or DNA obtained from a blood sample or perhaps from something the person had used, such as a toothbrush.

In Thailand the PM data and the AM data were entered into two data bases—the Automated Fingerprint Identification System (AFIS) and DVI System International. AFIS helped match fingerprints. The system used in Thailand was SAGEM Morpho, a French system owned by the AFP. The

Australian airline, Qantas, flew in a computer server and four work stations to assist in the compilation of information. The Australian contingent wanted to enter only PM data into this system until they had a good base but pressure for results forced them to also enter AM data as it became available. DVI System International, developed by the Danish firm, Plass data, working with the Danish police, helped match everything but fingerprints.

Although both systems generate possible matches between AM and PM data only a fingerprint expert or odontologist could confirm identification. When they did, a report was presented to a senior committee headed by a general from the Thai police. If that committee approved, the body was released.

There were problems using AFIS. Different countries used different methods of obtaining fingerprints and prints taken from the second layer of skin are less clear and smaller. There were problems with DVI System International because not everyone charts the same way and because 'no information' might mean a missing tooth or a tooth had never been worked on. There were also problems with numbering as people from different countries write numbers differently and handwriting can be illegible.

New Zealand, already working with Thai health officials, offered to process the DNA but China offered to do it without charge. The initial results were disappointing and questions were raised about the Chinese laboratory. However other laboratories also had difficulty as the bone samples were too small and had deteriorated. It was also a mistake to use teeth rather than bones from the femur or a rib. Months later, both the Chinese and another laboratory began to get good results. However, most early identifications came from fingerprints or dental records not DNA.

Thai personnel initially tried to sort bodies by Thai and non-Thai classification. However, those considered non-Thai were mainly Caucasian and the 'Thai' included many Asians. Singapore and Japan raised objections – as did Australia – arguing appearance and nationality were not significant identifiers. It was then agreed all bodies would be processed regardless of racial appearance.

Initially, working conditions in Thailand were intolerable with work being carried out in the open, often on the ground and with onlookers and media watching. There was 100 per cent humidity and up to 40 degrees Celsius in temperature. Gradually, the working areas were enclosed and electricians could supply air conditioning. Watching television, staff at a Norwegian company, Normeca, decided they could improve conditions and, with Norwegian government support, agreement from Thai Red Cross and assistance from Thai tradesmen, Normeca assembled a state-of-the-art morgue with air conditioning and running water.

The Thai people believe the spirit remains in the body and becomes restless if it is moved, however it is all right if the body is moved to a holy place. Normeca arranged for Buddhist monks to bless the new

facility. Normeca also arranged for European and Thai meals to be provided for workers.

Other difficulties

There were still problems.

Thailand is a federal country and the dead were in three different provinces. Arrangements had to be made for those provinces to approve any identification of a body from that province. This proved difficult when one province had a dispute with the federal government.

There were disagreements among the Europeans about the proper way to deal with a body. Arguments ensued because different people were doing different things in different ways. This led to the Scientific Advisory Group (SAG) being formed. The SAG established that fingerprints should be taken using powder and sticky paper rather than ink, and DNA be obtained from a femur or rib. While coming to an agreement proved easy, enforcing it was more difficult. Newcomers maintained their own way of doing things and those running a site resisted what they regarded as interference. Some countries tried to bypass the system by taking a second DNA sample which they sent to their own laboratory and withheld the PM forms hoping for a match. They used AFIS to do 'cherry picking'

searching for matches for their own missing persons. The management team refused to release any body not identified through the agreed process.

The major problem was AM data

After a plane crash there is usually a reasonably accurate list of passengers. Police can begin to collect AM data and the process of identification can begin. This was not the case after the tsunami. Thousands of phone calls to foreign ministries had to be reviewed and checked until a list was developed. Only then could police arrange for an individual's dental records or go to their home or school to look for fingerprints or DNA.

Getting the list accurate was difficult due to a number of problems. There were thousands of persons reported missing with many names duplicated. They had been reported missing by more than one person or reports were received from overseas and at home and they were reported by phone and email. In addition, so many people lost everything including mobile (cell) phones and it took time for them to contact family and friends.

Even after the lists became reasonably accurate, collecting AM data proved easier in some countries. Most Israelis serve



The collection of bodies for identification should include a record of where the body came from.

in the military which collects and maintains dental records, fingerprints, x-rays and blood types. As soon as the Israeli foreign ministry had a list of those missing, the military provided the police with their records. When PM data became available, it was easy to match it with AM data. Sweden also had an advantage because for 30 years Sweden has taken blood from the heel of a new-born infant. The government made that data bank available to police.

Other countries had difficulties. There were so many people missing and police assigned to collect data AM were inexperienced. Sometimes they had to be sent back several times before they found a fingerprint from a diary or behind a shelf. Some became more imaginative with one Swedish officer getting prints of a child who had been at a pre-school centre and had done finger painting. Others realized children were shorter than adults and so leave their fingerprints lower down the walls and on toys and tricycles. While most dental records in Scandinavia were of good quality, in other countries dentists chart only their own work. They don't do a chart that shows what was done before someone was their patient.

But the biggest problem was DNA. There are three kinds of DNA – reference, surrogate and familial. Reference DNA is obtained from a person's own blood (which made the Swedish blood bank records so valuable). Surrogate DNA comes from something the person has used, like a toothbrush or comb while familial DNA comes from relatives, ideally parents.

Since many of the dead included father and daughter, mother and son, or both parents and children, it was difficult to know who had used the toothbrush and familial DNA was not readily available. In addition, sometimes the father was not the parent. This added to the problems of obtaining useful

PM bone samples and it is easy to understand why little early identification was from DNA.

Because some countries were not efficient or perhaps not committed to obtaining AM data their nationals remained unidentified. That was the case for Thais. When it became apparent that few Thais were being identified, more AM data was collected in Thailand. As time passed, bodies were moved to the new morgue and various countries including Norway and Denmark took over the leadership. But the lack of AM data and the problems with DNA meant many bodies are still unidentified.

Sri Lanka and Indonesia

In Sri Lanka, thousands of bodies were taken to hospital casualty wards. In an effort to preserve them, some physicians painted them with formaldehyde. Then an official said the bodies presented a disease threat. While that was not true, it was believed and most dead were quickly buried.

Sri Lanka also ordered all bodies of foreigners be sent to Colombo. Because there were few foreigners, most people knew if someone was from another country, and many ended up in Colombo. Because roads were badly damaged and rail travel disrupted, others were buried because of the fear of disease.

Similar to the Thailand experience, some bodies were visually identified and released. Two people were with a tour group and their identity was confirmed by the tour operator while two others were identified by British relatives. When the two bodies from the tour group reached London, their identity was confirmed. The others, however, were not British: one was German, one Swiss.

Soon, as in Thailand, there was a multi-national agreement allowing foreign police and DVI specialists to work with Sri Lankans to identify the dead with final approval resting

with the host government, in this case the chief coroner (Sri Lanka has a coronial system similar to Commonwealth countries including Australia). In Sri Lanka many had been buried. German, Austrian and British police set out to find those graves. They were assisted by local residents who knew where foreigners were buried as most foreigners were buried separately. Thus foreign police and DVI specialists in Sri Lanka had three tasks. They had to:

- do post mortems on the bodies in Colombo;
- collect evidence about foreign graves to get exhumation orders; and
- reach agreement with Sri Lanka on how exhumations would be handled.

It was agreed that when a grave was opened, an attempt would be made to identify all bodies exhumed, not just foreigners. While the lack of Sri Lankan AM data made identification difficult, British police did identify 17 Sri Lankans.

In general, things went more smoothly in Sri Lanka than in Thailand for a number of reasons. These were:

- there were fewer foreign police and forensic scientists;
- all bodies were processed in a single line with international workers and Sri Lankans sharing the work;
- searching was done on a co-operative basis with German, Austrian and British police keeping in regular contact with the logistics centre in Colombo;
- a British officer in London kept the British officer in Sri Lanka informed about Thailand so problems could be anticipated and avoided; and
- those who knew where a foreigner was buried also knew who it was. PM data could be checked against AM data for that individual.

Australia and Indonesia discussed DVI but it was agreed this was impossible as the numbers were overwhelming. The total dead numbered at least 200,000 and sufficient storage facilities equipment and personnel were simply not available. Bodies were identified by those who knew them and most were usually buried in mass graves.

While Indonesia has fingerprint records for criminals and government employees, it proved difficult to impossible to obtain AM prints for most deceased. Their homes, often their entire villages, were destroyed. If prints had been found, it would have been difficult to identify who they belonged to. Dental records were also generally hard to obtain and finding AM DNA would have been next to impossible as whole families, including extended families, were wiped out.

The Indonesian police did try to identify their own personnel – roughly 14,000 police and police family members were killed in police compounds. They identified only about 41.

Legacy from the tsunami

It is too soon to tell the full impact of what happened.

It is clear that the initial response matched the second pattern with initial recovery of bodies by hundreds of individuals. This pattern is observed in many widespread destructive incidents. This does not in any way resemble the site control approach called for in Interpol guidelines. This reinforces the evidence that the guidelines are applicable only when mass death occurs at a controllable site.

One of the benefits arising from these events is that so many police and professionals worked together to strengthen the world wide network of response to mass death. In particular, the Australian who was the first to respond to Bali 1 was in Phuket. The Royal

Canadian Mounted Police (RCMP) from Swissair 111 were also there as was the Danish odontologist who worked on *Scandinavian Star*.

These experts shared and learned from each other. For example, an FBI fingerprint specialist showed how boiling a hand could lead to high quality fingerprints from the dermis (second layer of skin). This was used first in Thailand and again in Sri Lanka. In addition, Plass Data's DVI System International is now the preferred system in Europe and, since the tsunami, has been obtained by Canada and New Zealand.

What is not clear is if the methods used most effectively (such as palm prints) will be part of detailed guidelines. What is also not clear is if there will be the same level of international co-operation in future mass death incidents. Since the tsunami, there have been incidents in Spain, the UK, the United States and Pakistan all of which have chosen to go it alone. Pakistan and the U.S. both declined foreign DVI assistance after the earthquake and *Hurricane Katrina*. Of course, in contrast to the tsunami, most victims were citizens of the country impacted. In addition, few countries are likely to be as willing as Thailand or Sri Lanka to welcome foreign assistance.

The tsunami raises other questions. Is it appropriate to spend so much time and money to identify hundreds perhaps thousands of dead? What is the upper limit? Would a similar response have taken place in Thailand and in Sri Lanka if there had not been foreign dead? Is it appropriate to go to a country and identify only or mainly foreign nationals?

There are no answers to these questions at present. However this article reports on the first major cross-cultural study of the handling of the dead. Most previous research has been done in Western countries like the United States, Japan, Italy, Canada and Australia. Perhaps now

it will be easier to understand the issues and discuss them based on what has been learned.

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Bibliography

- Brannon, Robert B. and William M. Morlang (2001) "Tenerife Revisited: The Critical Role of Dentistry" *Journal of Forensic Sciences* Vol. 46 No. 3 pp: 722–725
- Emergency Communications Research Unit (1985) *The Gander Air Crash* Ottawa: Carleton University
- Hershiser, Marvin R. (1974) "Some Observations on the Handling of the Dead in the Rapid City, South Dakota, Flood Disaster" Newark: Disaster Research Center Preliminary paper # 12
- Interpol (1997) *Disaster Victim Identification Guide* (Pages are not numbered.)
- Nishimura, Akiyoshi (1997) "Statistical Investigation on Human Casualty in Kobe City on the Great Hanshai Earthquake" *Advances in Legal Medicine* 3 July pp. 346–349
- Scanlon, Joseph (1979) "Day One in Darwin: Once Again the Vital role of Communications" Joan Innes Reid, ed. *Planning for People in Natural Disaster* Townsville: James Cook University of North Queensland pp. 134–155
- Scanlon, Joseph (1998) "Dealing with mass death after a community catastrophe: handling bodies after the 1917 Halifax explosion" *Disaster Prevention and Management* Vol. 7 No. 4 pp. 288–304.

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